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EXAMINER
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TRAN, TRANG U

ART UNIT	PAPER NUMBER
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2614

DATE MAILED: 05/18/2004

4

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/888,271

Applicant(s)

GREENBERG, ROBERT Y.

Examiner

Trang U. Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-17 is/are allowed.
- 6) ☒ Claim(s) 18-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed March 03, 2004 have been fully considered but they are not persuasive.

In re page 9, applicant argues that Cappels fails to disclose the claimed "an edge detector circuit to generate an edge pulse signal ... responsive to a pixel clock and a phase detector circuit to generate a phase adjust signal responsive to a phase of the phase locked loop clock and the edge pulse signal as recited in claims 1, 18, and 31.

In response, it is agreed that Cappels does not disclose the claimed "a phase detector circuit to generate a phase adjust signal responsive to a phase of the phase locked loop clock and the edge pulse signal" as recited in claim 1 and; thus, claim 1 are found to be allowable.

It is noted that claim 18 recites a circuit, comprising:

**an edge detector to generate an edge pulse corresponding to a transition of an analog image signal response to a pixel clock;**

**a phase adjust circuit to generate the pixel clock by adjusting a phase of a phase locked loop clock responsive to a phase adjust signal; and**

**a phase detector circuit to generate the phase adjust signal responsive to the edge pulse signal.**

The claimed "an edge detector" is anticipated by the differentiator 42, the threshold detector 44, and the comparator 46 of Cappels, Sr. because the comparator output the transition of the analog image signal responsive to a pixel clock (col. 4, line

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60 to col. 5, line 26, the claimed "a phase adjust circuit" is anticipated by the phase adjuster 50 of Cappels, Sr. because the phase adjuster output the pixel clock by adjusting a phase of a phase locked loop clock (the pixel clock) responsive to a phase adjust signal (phase adjust 57 of Fig. 3), and the claimed "a phase detector circuit" is anticipated by the microprocessor 48 of Cappels, Sr. because the microprocessor 48 output the phase adjust signal (phase adjust 57 of Fig. 3) responsive to the edge pulse signal (the output of the comparator 46).

In re page 9, applicant also argues that Cappels does not disclose the claimed "generating a plurality of clock phases by delaying a phase locked loop clock signal by a plurality of delays".

In response, the examiner respectfully disagrees. As discussed above the claimed "an edge detector" is anticipated by the differentiator 42, the threshold detector 44, and the comparator 46 of Cappels, Sr. because the comparator output the transition of the analog image signal responsive to a pixel clock and the claimed generating a plurality of clock phases by delaying a phase locked loop clock signal by a plurality of delays is disclosed in col. 5, lines 57-64 of Cappels, Sr..

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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3. Claims 18-21, 25-26, 28-32, 34-38 and 40-42 are rejected under 35

U.S.C. 102(b) as being anticipated by Cappels, Sr. (US Patent No. 5,731,843).

In considering claim 18, Cappels, Sr. discloses all the claimed subject matter, note 1) the claimed an edge detector adapted to generate an edge pulse corresponding to a transition of an analog image signal responsive to a pixel clock is met by the differentiator 52 and the threshold detector 44 which is function together to detect voltage transitions between pixel instructions, also called pixels edges (Fig. 3, col. 4, lines 42-59), 2) the claimed a phase adjust circuit to generate the pixel clock by adjusting the phase of the phase locked loop clock responsive to the phase adjust signal is met by the phase adjuster 50 which produces an adjusted pixel sampling clock 64 that matches the phase of the video signal 52 (Figs. 3 and 4, col. 5, line 15 to col. 6, line 31), and 3) the claimed a phase detector circuit to generate the phase adjust signal responsive to the edge pulse signal is met by the phase comparator 46 and the microprocessor 48 (Fig. 3, col. 4, line 60 to col. 5, line 27).

In considering claim 19, the claimed wherein the edge detector generates the edge pulse signal responsive to the transition of the analog data signal greater than a predetermined threshold is met by the differentiator 95 and the threshold detector 100 which is function together to produce the pulse signal if the applied voltage pulse exceeding a predetermined threshold voltage (Figs. 3 and 5, col. 2, lines 5-28 and col. 6, lines 32-57).

In considering claim 20, the claimed wherein the edge detector generates the edge pulse responsive to a rising, falling, or both rising and falling edges of the analog

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image signal is met by the voltage transition location 20 which occurs between a change in voltage levels and between discrete pixel intensities 19 on video signal 12 (Fig. 1, col. 3, lines 6-43).

In considering claim 21, the claimed wherein the edge detector comprises a calibration circuit adapted to calibrate the analog image signal with the pixel clock is met by the automatically adjusting the pixel sampling clock frequency and phase to match the frequency and phase of the pixel clock used to generate an incoming video signal (col. 1, lines 60-64).

In considering claim 25, Cappels, Sr. discloses all the claimed subject matter, note 1) the claimed wherein the phase adjust circuit comprises a clock delayed circuit to generate a plurality of clock phases by delaying the phase locked loop clock signal is met by is met by the phase adjuster (phase shift of Fig. 4) 50 which produces an adjusted pixel sampling clock 64 that matches the phase of the video signal 52 (Figs. 3 and 4, col. 5, line 15 to col. 6, line 31), 2) the claimed wherein the phase detector comprises: a phase hit enable signal adapted to generate a plurality of phase hit enable signals corresponding to each of the plurality of clock phases, the phase hit enable signal being asserted responsive to the edge pulse signal is met by the hit detection process (Fig. 5, col. 4, line 60 to col. 5, line 27 and col. 6, line 58 to col. 7, line 37), and 3) the claimed a count corresponding to each of the plurality of clock phases, the count indicative of a number of assertions of a corresponding phase hit enable signal for over a predetermined time is met by the microprocessor 48 stores in memory 49 a number representing the total hits for that specific phase (col. 5, lines 3-27).

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In considering claim 26, the claimed wherein the phase detector circuit comprises: an enable signal to enable the phase detector circuit is met by the Q-output pulse 108 from the one-shot pulse generator 81 is true, data line 112 is set high, indicating that a "hit", a sampling edge in close temporal proximity to a video transition, has taken place (Fig. 5, col. 6, line 58 to col. 7, line 37), and the claimed a clear signal to clear each count is met by the NOT-Q output 118 of one-shot pulse generator 81, the latch 82 is reset to await for the next edge detection (Fig. 5, col. 6, line 58 to col. 7, line 37) .

In considering claim 28, the claimed comprising: a phase detector circuit generate phase adjust signals by analyzing the count is met by the microprocessor 48 which calculates a hit percentage for each varies phase and the hit percentage is the number of hits for a given number of video edges at a given phase to obtain which phase is the maximum number of hits, then the microprocessor 48 can determine the phase of the sampling clock with respect to the horizontal synchronization pulse that will provide the optimum sampling of the incoming video signal 52 (Fig. 4, col. 5, line 15 to col. 6, line 31).

In considering claim 29, the claimed comprising a phase locked loop circuit adapted to derive the clock signal from the reference signal responsive to a frequency adjust signal is met by the pixel sampling clock 55 which is a conventional phase-locked loop using a programmable divider and coupled to the horizontal sync pulse (Fig. 3, col. 4, lines 35-42).

Claim 30 is rejected for the same reason as discussed in claim 16.

The method claim 31 is rejected for the same reason as discussed in the apparatus claim 18 and further the claimed generating a plurality of clock phases by delaying a phase lock loop clock signal by a plurality of delays is met by the pixel sampling clock 55 which is a conventional phase-locked loop using a programmable divider and coupled to the horizontal sync pulse (Fig. 3, col. 4, lines 35-42).

Claim 32 is rejected for the same reason as discussed in claim 29.

Claim 34 is rejected for the same reason as discussed in claim 19.

Claim 35 is rejected for the same reason as discussed in claim 20.

In considering claim 36, the claimed wherein detecting a transition includes generating an edge pulse responsive to the transition and wherein asserting a clock phase hit includes comparing the edge pulse with each of the clock phase is met by the hit detection process (Fig. 5, col. 4, line 60 to col. 5, line 27 and col. 6, line 58 to col. 7, line 37).

In considering claim 37, the claimed wherein asserting the clock phase hit includes generating a plurality of clock phase hit signals corresponding to the plurality of clock phases and asserting only the clock phase hit signal closest to the transition is met by the hit detection process (Fig. 5, col. 4, line 60 to col. 5, line 27 and col. 6, line 58 to col. 7, line 37).

Claim 38 is rejected for the same reason as discussed in claim 25.

Claim 40 is rejected for the same reason as discussed in claim 26.

In considering claim 41, the claimed wherein counting includes generating a count for each of the clock phases and wherein counting comprises: examining the



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count; and adjusting the frequency of the pixel clock if the count exceeds a predetermined number is met by is met by the microprocessor 48 can determine the phase of the sampling clock with respect to the horizontal synchronization pulse that will provide the optimum sampling of the incoming video signal 52 by determining which phase obtains a maximum number of hits and the microprocessor 48 using line 67 to vary the pixel clock frequencies via the pixel clock 55 until a single, distinct, optimum setting is obtained (Fig. 4, col. 5, line 15 to col. 6, line 31).

In considering claim 42, the claimed wherein adjusting the frequency of the pixel clock comprises: changing the frequency of the clock signal; clearing the count; enabling the count; repeating the counting, examining, and adjusting if the count exceeds a predetermined number is met by is met by the microprocessor 48 can determine the phase of the sampling clock with respect to the horizontal synchronization pulse that will provide the optimum sampling of the incoming video signal 52 by determining which phase obtains a maximum number of hits and the microprocessor 48 using line 67 to vary the pixel clock frequencies via the pixel clock 55 until a single, distinct, optimum setting is obtained (Fig. 4, col. 5, line 15 to col. 6, line 31).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 27 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cappels, Sr. (US Patent No. 5,731,843)

In considering claim 27, Cappels, Sr. discloses all the limitations of the instant invention as discussed in claim 1 above, except for providing the claimed wherein the predetermined time is a number of image scan lines. The capability of using the predetermined time is a number of image scan lines is old and well known in the art. Therefore, the Official Notice is taken. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the old and well known of using the predetermined time is a number of image scan lines into Cappels, Sr.'s system since it merely amounts to selecting an alternative equivalent edge detector.

Claim 39 is rejected for the same reason as discussed in claim 12.

6. Claims 22-24 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cappels, Sr. (US Patent No. 5,731,843) in view of Ichiraku (US Patent No. 6,097,379).

In considering claim 22, Cappels, Sr. discloses all the limitations of the instant invention as discussed in claim 1 above, except for providing the claimed wherein the phase adjust circuit is adapted to adjust the phase of the pixel clock by delaying the reference signal. Ichiraku teaches that as is shown in Fig. 3, the phase adjusting circuit 2 of the present invention is provided with: a sampling clock generating circuit for detection 21, into which a standard clock (PCLK) which is synchronized with a horizontal synchronizing signal is inputted, and which divides this standard clock (PCLK) into a number  $m$  (a positive integer) of standard clocks, and which applies, with

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respect to these standard clocks, a delay amount proportional to the amount of the cycle thereof divided by  $m$ , and which generates and outputs, in stages, a number  $m$  of sampling clocks for detection (DPCLK [0,1,2,...,m]) having different phases (Fig. 3, col. 8, line 43 to col. 9, line 40). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the delay clocks (DPCLK [0,1,2,...,m]) having different phases as taught by Ichiraku into Cappels, Sr.'s system in order to accurately produce the sampling clock signal having an appropriate phase for sampling pixel data of the video signal.

In considering claim 23, Ichiraku discloses the claimed wherein the phase adjust circuit comprises: a clock delay circuit adapted to generate a plurality of delayed clock signals by delaying the phase locked loop clock is met by the delay clocks (DPCLK [0,1,2,...,m]) having different phases (Fig. 3, col. 8, line 43 to col. 9, line 40), and the claimed a multiplexer adapted to select one of the plurality of delayed clock signals as the pixel clock responsive to a phase adjust signal is met by the selecting circuit 22 which selects the appropriate sampling clock for detection and outputs this as the sampling clock (SCLK) to the pixel data sampling circuit (Fig. 3, col. 8, line 43 to col. 9, line 40).

In considering claim 24, the claimed wherein the clock delay circuit comprises an  $n$ -stage delay locked loop, each stage generating a corresponding delayed clock phase, each delayed clock phase being  $360/n$  degrees out of phase is met by the delay clocks (DPCLK [0,1,2,...,m]) having different phases (Fig. 3, col. 8, line 43 to col. 9, line 40) of Ichiraku.

Claim 33 is rejected for the same reason as discussed in claim 23.

***Allowable Subject Matter***

7. Claims 1-17 allowed.

***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trang U. Tran whose telephone number is (703) 305-0090. The examiner can normally be reached on 8:00 AM - 5:30 PM, Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W. Miller can be reached on (703) 305-4795. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TT TT  
May 15, 2004

  
MICHAEL H. LEE  
PRIMARY EXAMINER